The UK Defence Logistics Organisation's Defence Clothing Integrated Project Team

Turning Requirements into Solutions

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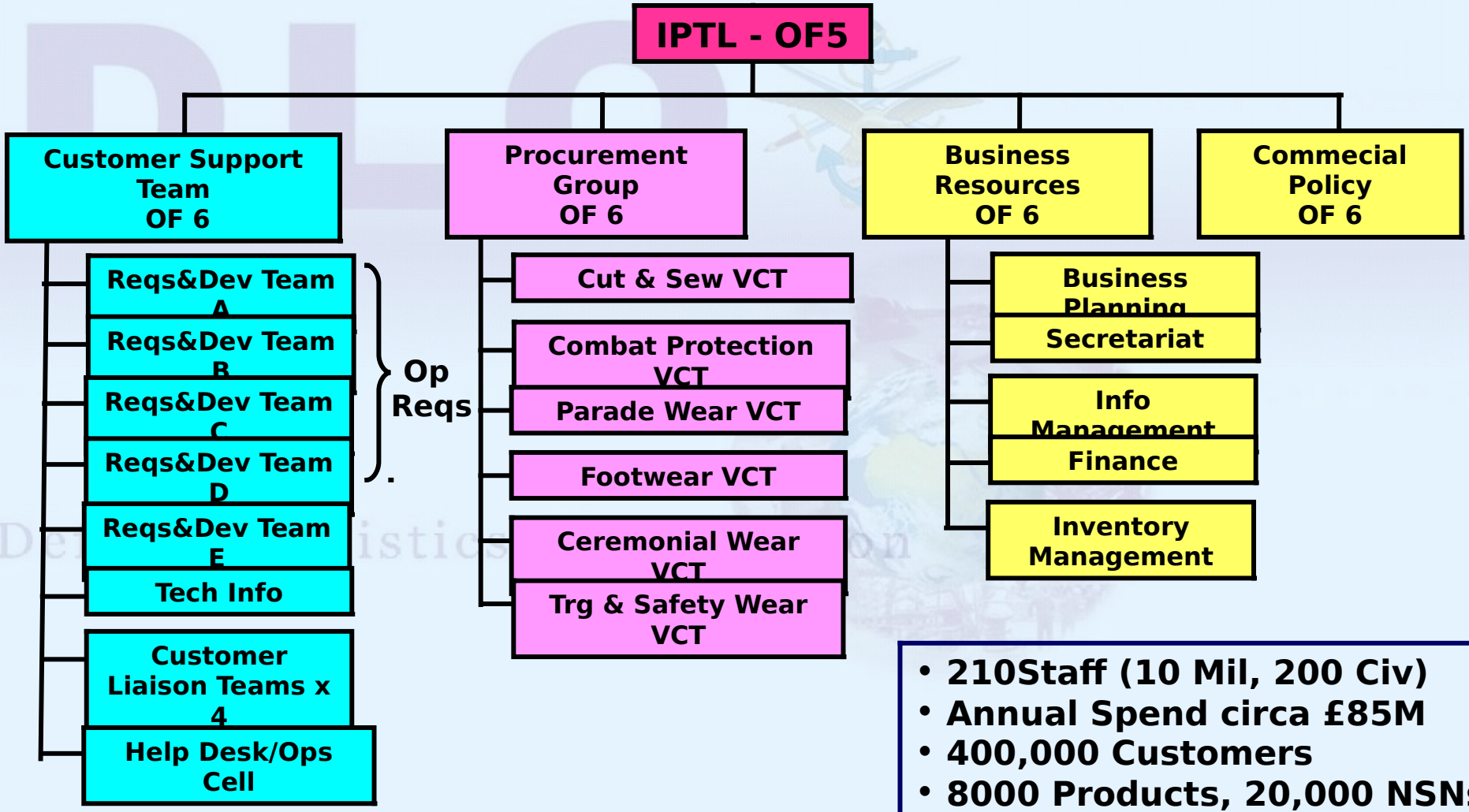
DC IPT - Developing and Supplying the UK Armed Forces Clothing Needs

Both operational and ceremonial

The Defence Clothing Integrated Project Team



- 210Staff (10 Mil, 200 Civ)
- Annual Spend circa £85M
- 400,000 Customers
- 8000 Products, 20,000 NSNs
- 40,000 Demands per month

DC IPT Website: www. mod.uk/dlo/dcipt

The Requirement

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Expeditionary Warfare

The Beast of Burden

The Infantryman's Burden:

Helmet

Clothing
Spare Clothing
Body Armour
Hydration System
Weapon
Boots
Bergen
Webbing
Rations
Ammunition
Personal Radio
Sleeping Bag

80-100kg

The Current UK Operational Clothing Inventory

- Based on conventional warfighting in NW Europe
- Consists of nearly 1000 Products and over 3500 NSNs
- Based on a commodity [illegible]r than capability

- Temperate DPM Combat Suit
- Desert DPM Combat Suit
- Waterproof Clothing
- Windproof Field Jackets and Smocks
- 7 types of Helmet
- 2 types of Body Armour
- Extreme Cold Weather supplement
- 11 types of Operational Footwear
- 16 types of glove
- 5 types of Load Carriage Equipment
- 2 types of Sleeping Bag
- Hydration equipment
- Riot equipment
- Specialist clothing for AFV Crews
- Specialist protective clothing
  - NBC, Bomb Disposal, Decontamination

The Operational and Technical Challenges

- Enabling an Expeditionary Force to deploy rapidly
- Enabling the soldier to operate in a range of environments
- Enabling a soldier to switch rapidly between roles and climatic conditions
- To increase durability without increasing weight or reducing air-permeability
- Cost-effective and comfortable Fire Retardant clothing
- Enabling the soldier to control his temperature without having to doff or don layers of clothing
- Developing multi-purpose equipment to reduce the inventory
- Finding the correct balance between risk and capability when providing adequate personal protection against a widening level of threat
- Increasing capability but reducing weight and volume

Some Lessons Learnt

- Rapid global deployment demands an agile supply chain and stock
- Clothing should be treated as a capability and not a commodity
- There are operational risks in trading protection for agility
- Hydration is a significant factor in dismounted combat
- Public opinion will sometimes drive equipment decisions
- There is a limit to industrial capacity and reaction time so need longer-term flexible contracting arrangements with an ability to surge production
- Combat clothing requirements are relatively uncomplicated but can be technologically demanding
- Have to educate the customer as to why he is wearing what he is wearing and sometimes why he cannot have what he thinks he wants
- Clothing design, quality and fit are important factors - a corporate image
- Be quicker at exploiting clothing technology advances in the leisure market

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The Requirement

The soldier needs to be:

- **Agile and not carrying more than 30 kg distributed over the body**
- **Able to operate over rough terrain equipped with durable kit**
- **Body (eyes, ears) protected against fragments, stab, blast, flame**
- **Protected against chemical and biological attack**
- **Kept warm and dry**
- **Comfortably shod and able to absorb shock**
- **Protected against microbial attack – fungal infection**
- **Able to fight at night and in poor visibility**

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Some Solutions

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Reducing Volume

Making items more compact so that maximum use can be made of the 100 -120 litre capacity rucksacks

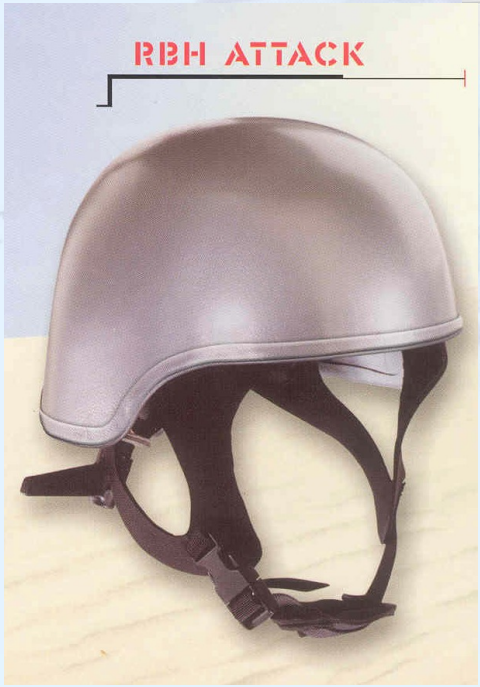
A new approach to sleeping

- The Double bag concept with removable, washable liner
- Offers choice, flexibility
- Reduced weight and packed volume
- Institute of Naval Medicine (INM) has successfully chamber tested and assessed thermal properties of clothing for “dress to sleep” regime.
- 45 Commando Brigade validated concept on Op TELIC

Reducing Weight

Weight reduction is subject to the laws of diminishing returns. However weight management is critical for specific areas such as the head or feet where small weight reductions can be significant - 1g on the foot = 5g on the back

An example of what is currently possible is the RABINTEX combat helmet.



- V_{50} +600 ms
- 950 gms (Areal Density 6.5kg/m^2)
- Current helmet 1.4kg

Improving Weight Distribution

Need to ensure that weight is more evenly distributed and that changes to the body's centre of gravity do not adversely affect fighting capability.

Improved Load Carriage System

- **Improvements to overcome back injuries**
- **Enhanced PLCE Yoke**

Better Use of Materials

Reversible prints to allow rationalisation of clothi

Anti- Microbial, sweat-wicking materials for better moisture management

Welded or glued rather then stitched seams

3 Dimensional seamless knitting

Materials that can be adapted - the new sniper suit is provided in one colour that it can be painted/sprayed to match the local environment

Meta-aramid materials that can be printed and are colourfast will provide durable, lightweight, FR clothing with the correct IRR

Integration of Systems/Equipment

Requirement for multi-functional clothing

- Body Armour that provides the chassis for load carriage
- Load Carrying Equipment that can be quickly adapted from patrolling to warfighting order
- Clothing that also provides NBC protection
- Textiles that can change colour in a controlled manner
- Textiles that carry power or information

The AFV Crewman's vest combines water carriage, body armour, FR and load carriage in one piece of equipment

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Multi-Purpose Equipment

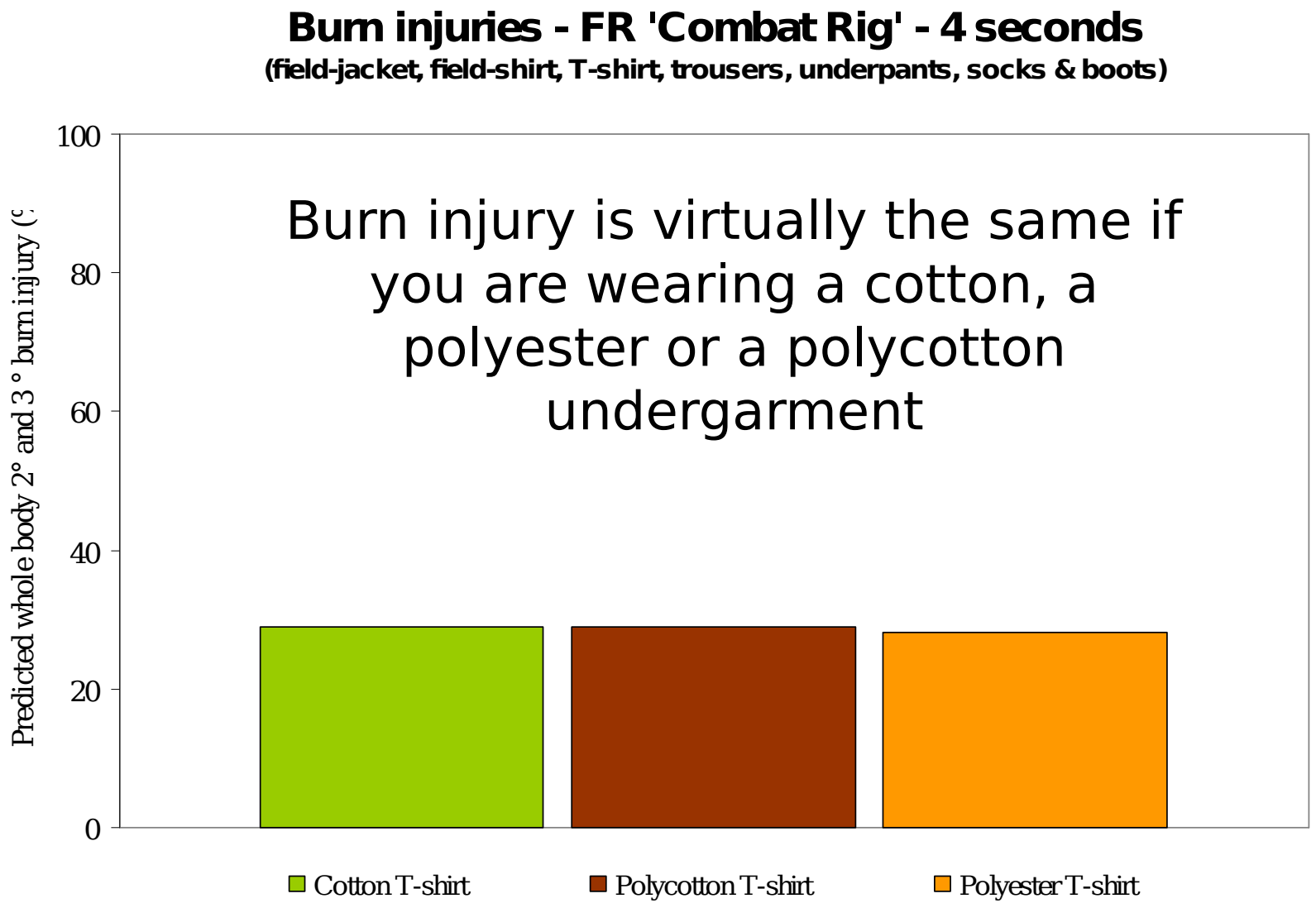
- Rationalisation of the operational clothing inventory - boots, gloves
- Reducing the variety of equipment
- Equipment that can be quickly adapted to different environments
- Multi-environment clothing

Protecting Against Flame

Often better protection can be provided through procedures rather than products. Although FR clothing can enable soldiers to survive for longer in flame, it will limit their ability to function properly, especially where there is already a significant physiological burden. Procedures that extinguish the flame rapidly can be more effective in delivering capability

Burns to the head are a significant cause of death from burns

Institute of Naval Medicine Flame Study


Burn injuries - FR 'Combat Rig' - 4 seconds
(field-jacket, field-shirt, T-shirt, trousers, underpants, socks & boots)
Predicted whole body 2° and 3 ° burn injury (
100
80
60
40
20
0
Burn injury is virtually the same if you are wearing a cotton, a polyester or a polycotton undergarment
Cotton T-shirt
Polycotton T-shirt
Polyester T-shirt

Reduction of Physiological Burden

Making equipment more bearable to wear

- **Reduce physiological load by reducing layers (MkIVa NBC Suit)**
- **Use the Equator as the baseline for clothing systems and build up from there**
- **Improving ergonomic design and providing better fit, e.g. currently 21 sizes of shirt but only two sizes of rucksack**

Improving endurance

- **Better heat management through improved garment design - under shoulder zips**
- **Management of operational load – local command decision as to what is actually needed**
- **Personal Cooling systems based on**

Mk IV

A Command Decision

While equipment can be provided, and technological solutions may be possible, procedures are equally important in enhancing the capability of the dismounted soldier

There is little value to be gained from attempting to reduce the mission load if the weight saved is only utilised to add more to the burden

It is a command decision as to

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Thank You for Listening

Any Questions ?